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FACTS AND FALLACIES  
IN  
VETERINARY SCIENCE;

OR

What the Farmers Should Know About  
Diseases of Animals.

BY

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## FACTS AND FALLACIES IN VETERINARY SCIENCE.

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In every department of physical science, there are certain facts which underlie all possible deductions. Every conclusion, therefore, worthy of scientific recognition, must be based on said facts, and serve as an explanation of them. Accordingly an accepted theory, among scientific men, is but the rightful interpretation of all existing facts in relation to the subject. Astronomy, chemistry, and biology are teeming with illustrations of such established principles. All of which, however, differ in a marked degree from an *hypothesis* that is based upon mere assumptions, and therefore often found to be fallacious on further investigations. Consequently a *fallacy* is a deceptive conclusion, drawn from the imagination of its author.

Nowhere are faulty methods of reasoning more frequently met with than in the practice of the Healing Art; and this is largely due to the system of education by which the votaries have thus attempted to fit themselves for this ennobling work. In fact the difference between a true and empirical method of curing disease depends wholly upon the degree of intelligence which the practitioner may possess. If the physician has all the necessary facts in relation to the anatomy and pathology of the malady in question, the therapeutical indications are easy of conception, and this treatment, therefore, is practically the result of a scientific conclusion. But the quack, whose scanty knowledge of disease rarely enables him to distinguish one ailment from another, can never give an intelligent reason why he uses a certain remedy, or what effect it may produce. Hence a system of practice, either in human or veterinary medicine, which is not based upon the established principles of biological science, is fallacious in theory and dangerous in its consequences.

The crude notions of disease, so frequently exemplified in the practice of the uneducated farrier, are almost invariably the gift of a fertile imagination, rather than the result of any pathological investigations. It therefore behooves us in the study of the Veterinary Art, to lay broad the foundation of knowledge, and thus

*presented by author*

inquire into the real nature and cause of the malady, before searching the *materia medica* for a cure. This will require a general knowledge of structure and of the anatomical relations of parts, before any facts, in a pathological point of view, can have the slightest bearing on the question of treatment. For instance, how can a farrier diagnose and successfully treat a case of pneumonia, in its various stages, who has no knowledge of the real structure of the lungs nor of the circulation of the blood. Hence, the importance of

#### COMPARATIVE ANATOMY.

A general knowledge of the mechanism and physiology of the animal body is absolutely essential for the discrimination of disease. The location and phenomena of symptoms cannot be accurately interpreted without an intimate acquaintance with the structure and functions of the internal organs. A case of acute nephritis, therefore, might easily be mistaken for an inflammation of other abdominal viscera. All these maladies would appear mysterious, and to the uneducated eye, essentially the same. In fact those characteristic symptoms of specific and organic disease would have no meaning to one not familiar with the general organism.

Much quackery would cease, and many fallacies concerning the nature and seat of disease must inevitably be dispelled from the public mind by the general diffusion of anatomical knowledge.

The comparative relations of the joints and parts of animals, to those of man, are not well understood, especially, by those most interested in the care of stock. This want of knowledge has, many times, led to fallacious conclusions, which have served as a barrier in the pathway of veterinary progress. But the popular demand for those practical facts which a knowledge of anatomy alone can give, are propitious omens in the canopy of our profession, and thus indicate the future trend of all such needed inquiries.

The relation of man to the higher mammalia, which has caused so much speculation among philosophers and naturalists on certain zoological affinities, is especially interesting and instructive in an anatomical point of view. The skeletal framework and internal organization of our domestic animals are morphologically identical with the structure of the human body, and thus subserve the same purpose in the animal economy. The limbs are similar in mechanical design, are made up of the same kind of bones and joints, and are therefore subject to analogous diseases from expo-

sure and accidents. Hence the necessity of more carefully studying the structure of animals, that we may better understand the nature and situation of the difficulty in every creature that we are called upon to relieve. This leads us therefore very naturally to inquire into the

#### HOMOLOGY OF BONES AND JOINTS.

Though all vertebrate animals are built upon the same general plan of structure, yet we find a modification of this plan in the four great classes known as fishes, reptiles, birds, and mammals, so fit them for their several spheres in life.\* But the special details of structure on which genera are founded are well illustrated by the variety of form in the limbs of quadrupeds.

In all animals which crop their forage from the ground, and thus use the legs simply as pedestals, have no necessity for that power of rotation in the fore arm, which man and carnivorous animals possess in such a marked degree, as organs of prehension. The radius and ulna therefore have grown together, in accordance with nature's law of economy and strength, both in the horse and in all animals that chew their cud. This anatomical fact has enabled the geologist to predict the herbivorous character of a fossil species from a single bone. But in the hog these bones are not united, yet they are so closely adjusted that the power of pronation and supination has been lost.

The cannon bone of ruminants furnish another very interesting fact, and one that is of equal importance to the paleontologist in determining the character of a fossil animal. This round bone of the leg, unlike any other in the animal kingdom, contains two marrow cavities which result from the union of the third and fourth metacarpal bones in the anterior extremity, and of the metatarsals behind. This is indicated by the double articulation which it makes with the two phalangial rows, contained in the claws of the divided hoof. In the embryonic stages the cannon bone readily divides into its two component parts, but at birth they cannot be separated in any of the ruminating animals. In swine, however, these two corresponding bones do not unite though always in close contact with each other.

Accordingly the forward foot of the hog represents a human hand, with the exception of a thumb. The two toes, therefore,

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\* See MacLise's Comparative Osteology, or the Morphology of the Vertebrate Skeleton, illustrated folio, London, 1847.

which these animals and all others with a divided hoof walk upon, correspond to our middle and ring fingers, and the bones in the dew-claws represent the index and little finger.

In the horse, however, the cannon bone is single, and has but one toe, which represents the middle phalangial row of the human hand. Morphologically the nail is the hoof, and the three bones of the finger are known by the veterinarian as the coffin, coronet, and pastern. The larger knuckle of the hand, therefore, is the fetter-lock joint of the horse, and the wrist the forward knee. The elbow is represented by that projecting point, on the back of the leg, close to the chest, where "shoe-balls" occur.

The hind leg also, has some peculiarities in its mechanism that become very interesting points in the treatment of disease. The hock-joint, which is delicately constructed, and so frequently the seat of lameness from a sprain, answers in an anatomical point of view to the instep of man, though its relative position to the ground has been very much changed.\* In view, therefore, of the comparative relations of limbs, we shall find, much to the surprise of the casual observer, that the stifle-joint corresponds, in every particular, with the human knee, and consequently the stifle bone, so often dislocated by accident, is the homologue of the patella or knee-pan. The necessity, therefore, of a thorough knowledge of these anatomical facts to aid one in the diagnosis and proper treatment of those obscure joint difficulties, is now apparent to all, and its importance cannot be over-estimated in behalf of a scientific practice in this department of the Healing Art.

#### DENTITION OF DOMESTIC ANIMALS.

The teeth belong to the digestive system, and though firm, hard substances, and even implanted in the maxillary bones, yet they are no part of the osseous skeleton. They are developed from the mucous membrane along the walls of the anterior portion of the alimentary canal, and thus serve as the mechanical agents in the division and preparation of the food. The teeth, therefore, are adapted in the carnivorous animals for seizing and tearing flesh; while in the herbivora, they are modified to suit the changed condition of the creature. In fact, almost every conceivable gradation of purpose may be served by these important organs in the economy of the different orders, genera, and species of mammals.

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\* See Owen On Nature of Limbs, 8vo, London, 1849.

In the walrus, or sea-cow, we find a pair of tushes developed to such an extent that they are used as organs of locomotion when the animal is basking upon the shore; and the fossil dinotherium of the tertiary epoch evidently used a similar pair of front teeth on the lower jaw, as a means of anchorage.

The beaver, like the carpenter with his tools, diligently applies his gnawing teeth to the wood, and thus prepares, and by the same means transports the building material for his dam.

The elephant and the musk-deer have well developed teeth, that are employed as weapons of defence, while the hyena and the dog show their glistening ivory when in rage, and use the same as weapons of combat.

Nowhere is the secondary use of the teeth more evidently displayed than in man, where they not only contribute to beauty, but to his inimitable power of speech.

Hence, the teeth are important in a zoölogical point of view, and greatly aid in the classification of animals.\* So intimate are the relations of these organs to the general economy and habits of an individual, that the naturalist is often enabled to determine the position of a fossil creature, in the scale of being, by the teeth alone; and not unfrequently these are the only relics to be found to mark the existence of some huge monster, whose skeleton has mouldered back to dust.

These organs are composed of three distinct anatomical elements, known as the dentine, the enamel, and the crusta-petrosa. The first was so named by Prof. Owen of London, in 1835.† It forms the bulk of the tooth, and is very firm and solid; hence it has been called the bone of the tooth. A modified form of it, as seen in the tusk of the elephant, is called *ivory*. It is made up of a series of minute tubes and cells, with earthy particles interposed. The dentine of the higher mammals is unvascular, but its nutrition is carried on by means of these tubes connecting with the pulp.

The enamel is the hardest substance in the animal body, and consists of earthy matter deposited in an organized matrix. It forms a perfect sheath around the dentine, except in the lower portion of the root. In man and the carnivorous animals, it permanently covers the crown, but in the herbivora, where the teeth are long and gradually wear away, it soon becomes denuded. Here it

\* For further details consult article on *Teeth* in Cyc. Anat. & Phys., vol. 4th, London, 1852.

† Transactions of Zoölogical Society.

takes on a new form, being folded upon itself, and in the grinding-teeth, it presents a peculiar appearance, interspersed with dentine. In the front teeth of the horse it forms a deep cavity, known as the infundibulum, or "the mark" so frequently alluded to by veterinarians, in determining the age of an animal.

The *crusta-petrosa* is a hard bone-like substance, which covers that portion of the teeth within the jaw. In its structure and manner of growth it resembles the osseous tissue more than either of the dental elements. It varies greatly in quantity on different teeth, and is not uniform on different parts of the same tooth. It is the thickest at the end of the fang; and where it covers the enamel it appears like a thin layer of cement, which name also has been applied to it by various authors. This fills the bottom of the infundibula, and forms an oval island in the sack of the enamel, which is well seen in comparing the "marks" of five, six, and seven year old horses. As the teeth wear away the nerve begins to recede from the crown, and this cavity also is filled with cement, which makes the "dental star" in the lower incisors, at about twelve years of age.

There is a great variety in the form and number of teeth in different animals, and in all cases, there seems to be a special adaptation to their use in nature. The relation therefore that one kind of dentition holds to another becomes exceedingly interesting, especially as we review the order of succession, and thus endeavor to explain upon zoological principles

#### THE ORIGIN OF "WOLF-TEETH."

 Naturalists are agreed that the typical set of mammalian teeth are forty-four, and these anatomists have divided into four distinct series. The front teeth, on account of their nearly uniform shape in all animals, have been designated the *incisors*, and vary in number from two to six; the next in order backward, are the *canines*, or bridle-teeth of the horse; then comes the four *premolars*, and lastly the three *molars*, as here represented:

Incisors,  $\frac{3}{2} + \frac{3}{2}$ ; canine,  $\frac{1}{2} + \frac{1}{2}$  premolars,  $\frac{4}{2} + \frac{4}{2}$ ; molars,  $\frac{3}{2} + \frac{3}{2} = 44$ .

This formula represents the teeth equally divided above and below, and upon the right and left side. But all animals do not possess this number. Man has only thirty-two, and comparing them with the typical set, we find that the outer incisors in both jaws are lost, the canines are in place, and so are the molars, but of

the premolars, only two are present, and these are known as the bicuspids.

In the horse and ruminants we find the molars and three of the premolars, making the six grinders, present; and not unfrequently the first milk-molar in a rudimentary form, which may be called a *supernumerary*, or better known among horse-men as the "wolf tooth." These are always present as germs, at least in the lower jaw, and sometimes developed there, but almost invariably to be seen on the upper-jaw, just in front of the grinders, as shown in the following diagram of the deciduous teeth of the horse, ox, and sheep and swine.

Incisors,  $\frac{3}{2} + \frac{3}{2}$ ; canine,  $\frac{1}{2} + \frac{1}{2}$ ; molars,  $\frac{4}{2} + \frac{4}{2} = 32$ .

By comparing these two formulas we perceive that the permanent incisors and canines replace the corresponding milk-teeth, and that the second, third, and fourth premolars take the place of the deciduous molars, so called. The first milk-molar is not numerically replaced by the second growth of teeth, inasmuch as there are but three premolars in any living animal; though Prof. Owen claims that the hog has a complete set. But there is evidently some mistake about the dentition of the *Suidae*, as I shall endeavor to show further on.\*

This peculiar denticle which horse jockeys claim is the cause of sore eyes, blindness, and other ophthalmic troubles, is simply an unshed milk-tooth, always to be seen in the colt's mouth, and not unfrequently in the full-grown horse. The occasional presence, therefore, of this diminutive tooth, with the permanent set, only illustrates the law of reversion, and should be looked upon in a zoölogical, rather than in a pathological point of view.

Professor Leidy of Philadelphia has found in his well known osteological researches concerning the extinct mammalian fauna of Dakota and Nebraska, that the Anchitheridan family of solipeds, now found fossil in the *Mauvaises Terres*, had a similar dentition to the horse; thus showing that this noble animal, in its paleontological lineage antedates the lapse of historic time. Hence the wolf-tooth becomes an interesting relic in the study of natural history. The various diseases of the eye, therefore supposed to be caused by this nerveless tooth, must have prevailed throughout a long geological period, before the advent of man or the introduction of the dental art.

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\* See Owen's *Odontography*, London, 1845.

It is not a little singular that the farriers of this country, who almost invariably claim to have found this dental rudiment so very troublesome in the horse, have not paused in their pretended search for facts, to inquire whether similar diseases did not exist in other domestic animals, where these wolf-teeth were quite as prevalent.

In swine the first deciduous molar is well developed, and occupies a medium place between the tusk and the second premolar of the permanent set. It is always present in our fattened pigs, but rarely found in the wild hog, on account of their voracious habits in obtaining food, by which means these tenderly-rooted teeth soon release their hold. Seeing a difference in dentition, therefore, in the adult animal, Cuvier was led in his classification to separate the domesticated varieties from the feral species. This observation, however, was soon corrected by other naturalists, and the hog is now looked upon as the only animal in existence that has a typical set of forty-four teeth. But this conclusion is fallacious, and its elucidation will throw new light on the "wolf-tooth" question.

According to the typical formula of deciduous teeth, swine, horses, ruminants, and dogs have a complete set, or their corresponding germs. All these, when developed, are displaced by those of the permanent set, except the first molar on each side, above and below. The second, third, and fourth premolars, therefore, take the place of the last three milk molars; and in no existing animal is the first premolar present, but it has been found in the Elotherium and other fossil mammals. Consequently the so called "wolf-teeth" exist, for a while, in every animal that had a complete set of deciduous molars.

The hog, therefore, has not a typical number of teeth as naturalists have claimed, but, like the horse, has only forty in the second dentition. Though the shoat has forty-four in his mouth at a given time, yet the four small ones back of the tusks are milk teeth that have not been shed, and are in every respect homologous with those noted ones in the horse, and would bear the same relations in position with the grinders were the premolars in the hog as well developed. In the two-year-old colt these denticles are always to be found, especially on the upper jaw, and not unfrequently in the lower one, or the germs are there, the same as in calves and lambs.

Thus we perceive that these wolf-teeth have a wide zoological range ; and as there is no reason upon anatomical grounds why

they should be more troublesome in one animal than another, let us now review in detail some of the more salient points in their supposed

### X PATHOLOGICAL SIGNIFICANCE. X

At an early age in veterinary lore, when the diseases of the eye were but imperfectly understood, the farriers, for want of real knowledge on the subject, were led to attribute this frequent ophthalmic phenomena to some strange cause. The presence, therefore, of these diminutive teeth in the mouth of an afflicted animal that were of no conceivable use whatever, caused them to be looked upon with not a little curiosity. They sought an explanation of this seemingly dental freak of nature, but their limited knowledge of anatomy gave no clue to the mystery. These teeth were frequently met with as an accompaniment of periodic ophthalmia and other forms of sore eyes, and, believing that nothing was ever made in vain, they at last conceived that these worthless denticles were the real cause of the trouble.

Accordingly this view of the subject has been handed down with increasing confidence, from one generation of horsemen to another, without ever stopping to inquire into the nature of the malady in question, or the imaginary facts upon which this theory was founded. Hence it is not strange that a horse in this country is now rarely purchased without first examining the mouth for wolf teeth, from fear that the animal sooner or later may become blind. But the horse-jockey is not alone in this delusion. Members of the regular medical profession, and not a few professed veterinarians, have lent their influence in this direction, until it has become the popular belief throughout the length and breadth of our land.

Now what are the facts which would seem to justify such an erroneous conclusion; and why have not rational men seen this fallacy long ago, and thus sought a real explanation of the matter? There can be no excuse for such a course, and this lamentable ignorance among our people only illustrates the importance of a better system of education for the sons of the soil, in every state where stock-raising has become the leading traffic.

Hence I have felt it my duty, on every occasion for the last ten years, to protest against this system of quackery, but thus far I have found but little assistance among educated men; and this is why I have thus attempted to call public attention to the

subject, in hopes that the facts in the case may be better understood.

As every colt has a pair of wolf-teeth on the upper jaw, a large majority of which are shed with the milk molars, at three years of age, it is therefore evident that only a small proportion of horses could ever be troubled with this peculiar form of blindness. But this is not the case. All horses are subject to occasional attacks of sore eyes, whether they have these wolf-teeth or not; and if these wonderful teeth are not the cause of at least nine-tenths of the cases that occur, why need we suppose that the remainder are in any way attributable to the presence of these dental rudiments in the jaw, when the history, symptoms, and necessary treatment in a given number of cases are all the same.

Furthermore, an acute inflammation of the membranes of the eye is often of an epizootic character, periodic in its invasions, and thus attacks a large number of animals at once. It accordingly comes and goes with the seasons, and the degree of severity is not so much due to the condition of the horse as it is to the amount of exposure, and the inclemency of the weather, for an animal in any condition is liable to become involved in such a distemper. Hence I trust all will admit that the cause in question is atmospheric, rather than of dental origin.

If wolf-teeth are ever the efficient cause, the trouble should be permanent, unless they are at once removed. But as the majority of these cases are of short duration, and readily yield to treatment, regardless of the teeth, we cannot therefore ascribe any very marvelous cure to their accidental removal. Consequently we should expect to find all wolf-teeth associated with some chronic disease of the eye, like cataract, but unfortunately for the argument this is not the case, as many old horses still retain them and have perfect vision. On the other hand, many cases of the opacity of the lense have occurred where no such dental cause could be found.

Accordingly this wolf-tooth delusion must now take its allotted place in the history of the past, and this quackish dental art can no longer be considered that ophthalmic panacea, which centuries of horsemen have firmly believed in, and is endorsed by many of them to-day.

#### FALLACIES ABOUT DISEASE.

Without a knowledge of the fundamental principles of pathology and its kindred branches of science, disease cannot be

investigated nor its real nature understood. In every morbid action there is an abnormal condition of the system or of certain parts. Any inquiries therefore pertaining to the character of a given malady, necessitate a previous knowledge of the structure and function of the parts involved, without which every conclusion must be questionable. Hence the many existing fallacies about the nature and causation of disease that have no foundation in fact, but have crept into popular favor and practice through lack of professional ability on the part of those who pretend to be qualified veterinarians. In passing, therefore, we shall notice some of the more familiar examples to which these remarks will apply.

#### ANCHYLOSIS OF JOINTS,

An osseous deposit around the pastern joint is known as ringbone. It greatly interferes with the motion of the joint, and often causes a severe form of lameness. The disease may arise in various ways, but it is usually the result of an inflammation of the extremities of the bones, and of their articulating surfaces, either from direct injuries or a strain.

Synovitis and periostitis are therefore the inevitable result of an injured joint. Bony matter is deposited upon the inflamed surface, and thus a complete osseous union or an ankylosis of the joint at last occurs. This new formation gives rise to the enlargement, a ring of bone, which by all efforts to cure can never be removed. Consequently a cured ringbone is where the upper and lower pasterns have grown together, and where there is no motion of the joint, and if the bunch is not large, all lameness will cease. Hence the only rational method of cure consists in hastening this bony union, and this can best be done by the free use of the blister and the firing-iron.

But there are many vague notions about this disease that have long been received by the uneducated farrier, as an explanation of the difficulty. "Leakage of the joint" is now the more commonly accepted opinion among horsemen. While certain quacks in want of a nice little surgical job, claim that "ringbone is caused by a bladder, situated behind the joint that feeds it," and therefore its immediate extraction is the only curative means to be employed. Such fallacies need only to be pointed out to be discarded, and with the true anatomical explanation given, these empirical methods must cease.

Another form of morbid bony growth, frequently met with

both on the forward legs and behind, and one that often causes severe lameness for a short time, is the union of the splint with the cannon bone. This trouble usually arises from an injury, which sets up a periosteal inflammation about the parts, when an osseous callous results, thus cementing the two bones together. This having been accomplished, either by nature alone or by the aid of the surgeon's art, the animal ceases to limp, and the case is permanently cured. The bunch will gradually recede in size, and sometimes entirely disappear, so that it can be neither seen nor felt, but the two bones are firmly united and can never be separated. The claim, therefore, that "a splint can be taken off" and thus leave the leg natural again is a fallacy, as a moment's inspection of the bone afterwards would show, yet the horse in reality is none the less valuable.

But this is not the case with spavin, which consists in the growing of two or more of the tarsal bones together. The hock, before described, is a very delicately constructed joint, made up of six bones, and bound together by various ligaments. Situated at the posterior angle of the hind leg, which does most of the work in drawing, it is therefore frequently subject to severe strains, causing immediate lameness.

A general inflammation follows, succeeded by synovitis, perostitis, and ankylosis of one or more of those small joints. The cure, therefore, for spavin, like the other allied forms of disease, consists in hastening the bony union of the parts involved, by the use of the hot iron, blisters, and liniments. It may at first be confined to the scaphoid and large cuneiform, and thus end with their ossific union, but other bones may become involved, and ultimately it may extend to the whole joint, often causing an immense enlargement of the hock.

#### "CHEST-FOUNDER."

This term is a misnomer as applied to the seat of disease in the forward leg. The trouble is invariably in the feet, and the symptoms by which it can be thus recognized are unmistakable. The horse "points" the foot, or stands with the heel of the shoe raised from the ground, always steps short, and in Scotland this gait is known as "groggy-lameness."

After some time standing, the heel becomes contracted, grows down long, from want of wear, so that the hoof looks like a collar-box, being nearly as high behind as in front, and smaller than the

other foot. There is heat and also tenderness on pressure in the hollow of the heel.

The sunken condition of the chest is a fallacious symptom, inasmuch as the two anterior thoracic muscles have shrunken in size, or atrophied merely from want of use in throwing the leg forward naturally, instead of taking those short steps, as compelled to, on account of the morbid condition of the navicular joint.

The degree of lameness varies greatly with the condition of the foot. When the foot is dry, and upon a dry hard road, the horse is sure to limp, and always starts off lame; but in soft muddy going, or upon a sandy road, after soaking the foot, the same animal might not for miles take a lame step. Hence the necessity of special attention to the feet in cases of this kind.

Any treatment therefore directed to the supposed trouble in the chest, by way of seatons blisters, or even liniment, only evinces the mistaken notion of the practitioner, and thus clearly sets forth another popular fallacy, which has long held sway among horsemen as a substitute for knowledge.

#### ACUTE LAMINITIS.

Another trouble in the foot, that is often compounded with the last, is real founder, or an acute inflammation of the lamina which lines the hoof, and thus surrounds the coffin bone. This dreadful disease is of frequent occurrence, and is caused by over-exertion, high feeding, cold water, and exposure.

The pain and suffering is very agonizing and persistent for several days, unless relieved, and the congested condition of the blood vessels, between the bone and the unyielding horny box, foreshadows to every intelligent practitioner the real surgical treatment, which the patient at once requires. Hence no time should be lost in attempting to obtain relief. The early abstraction of blood, therefore is the great desideratum. Unload the vessels and the exudation will not occur, and thus eventually destroy the foot.

#### SWINE PLAGUE.

This is a specific infectious disease, peculiar to swine, and is not communicable to man or other animals. It rarely occurs but once in an individual, as one attack serves to protect the system against a second invasion. The disease is especially contagious by the

breath, and all hogs thus exposed are liable to become infected. Hence the necessity of strict quarantine regulations in the management of every outbreak, and all sick ones should at once be secluded from the herd.

The symptoms by which this malady in its different phases can be recognized are of a threefold character, and which may well be designated as the febrile, the choleric, and hemorrhagic. At first the hog shows some indisposition, has a slight rise of temperature, and occasionally coughs. In fact the majority suffering from this form of the disease would scarcely be recognized as being sick, upon casual examination.

But in the second stage when the "cholera" symptoms appear, there can no longer be any doubt. The disease now assumes a grave form, and is usually attended with a high rate of mortality. The animal becomes inactive, refuses to eat, but is very thirsty. The high temperature, labored respiration, and severe cough, indicate in a marked degree an internal inflammation. Pneumo-enteritis therefore well expresses the real pathological condition.

The bowels are at first constipated, but soon followed with a fetid diarrhoea, which hastens fatality. The discharges are slimy, and often stained with blood, which symptoms are very characteristic of the nature of the malady. A reddened skin is a very common symptom, and this, together with the enlarged lymphatics of the groin, become an important aid in diagnosis.

In the hemorrhagic forms the disease occurs without premonition, is very violent in character, and invariably fatal. A state of collapse is, in fact, the first symptom. The extremities become cold and numb, and the circulation is very inactive. Hence the stagnation of blood, with a dark purple hue of the skin, and large ecchymosed spots, is the inevitable sequence.

This swine plague can be communicated by the inoculation of the bronchial mucus, and the fluid from the peritoneal cavity. The blood is also virulent; thus showing that the disease belongs to the same infectious group with pleuro-pneumonia, small-pox and tuberculosis, and accordingly spreads by contagion only. Medicinal treatment, therefore, can have but little effect in cutting short the course of this malady. Conduct the mild cases to a favorable termination is all that can be reasonably expected.

## X GLANDERS AND FARCY. X

Of all the diseases of the horse the above are by far the most loathsome and foreboding. It ranks among the few great scourges of the land, and it is decidedly the most contagious malady of the equine race. By inoculation it is transmissible to man and other animals, but not to bovines.

It belongs to the group of infectious diseases, and has its own specific virus, which can be cultivated to any extent. Glanders, therefore, extends itself by contagion only. Nor is it ever the sequel of any other malady, unless the germs had previously been implanted there.

Though differing phenomenally, in many respects, the virus of glanders and of farcy are pathologically identical. One can be reproduced from the other by inoculation, and this is the sure criterion for deciding a doubtful case of either.

The symptoms, therefore, by which glanders may be diagnosed at the earliest moment possible are of great importance to the veterinarian for the protection of life and property. The disease is often obscure, and the pathognomonic signs for a long time remain latent.

The discharge from the nose is not *alone* characteristic. It even varies greatly at different stages of the real malady. The enlarged gland on the same side, especially if it is not hard, inflamed and tender, renders it *more* suspicious; but when a *chancre* appears in the nostril, the case is *beyond a doubt*. Without the corroboration, therefore, of these three cardinal symptoms, or a successful inoculation in a healthy subject, no one would be justified in sacrificing a valuable animal, unless they knew the horse had been exposed.

The treatment which a well-marked case of glanders or farcy should receive is not medicinal. As soon as the real nature of the disease is known, the animal should at once be sacrificed. All effort to cure an undoubted case is futile. The progress of the disease may be checked for a while, by rest, good care, and supportive treatment, but as soon as the horse goes to work again, and thus begins to lose condition, the case becomes aggravated and death is sure to follow.

In certain chronic forms, however, an animal has been known to live for several years, and thus be the means of disseminating the contagion. Consequently all suspicious cases should be held in

quarantine until the real nature of the malady in question can be determined by inoculation; and this should be resorted to at once, if the crucial test upon the nasal membrane is not in sight.

#### EPIZOOTIC PLEURO-PNEUMONIA.

This is another specific malady, and the one of most contagious of bovine animals. It never attacks the horse and hog, nor can it be conveyed to the human subject. The disease spreads by virtue of its own infection, and never arrives spontaneously. No filthy abode, nor any combination of unsanitary conditions can produce it, without the presence of these stealthy germs to contaminate the place. This dreaded scourge, therefore, is not easily extirpated nor controlled wherever it occurs.

Like other diseases of this class, it runs a natural course and cannot be cut short. Hence, to conduct to a favorable termination is all that can be done by way of treatment. Strict quarantine regulations should be resorted to at once, and thus the cordon tightly drawn, when the disease first breaks out. The want of such sanitary measures has cost this country already a sad financial experience, and still the disease is uncontrolled for want of means to stamp it out.

#### TUBERCULOSIS.

Though other plagues operate in a more summary manner, yet the ravages from this disease are none the less to be dreaded. The sure but stealthy march, of late years, which this insidious malady has made upon some of the finest herds of our land has awakened a deep interest among breeders concerning its real specific nature and hereditary transmission.

This old-fashioned and long-known scrofulous consumption of cattle has now been placed, by the rapid advancement in veterinary pathology, among the contagious diseases. The great liability, therefore, of its direct transmission to human beings through the agency of infected milk is one of the most important questions to-day before the public. Consequently, the wide-spread prevalence of this fatal malady among the cows of this country will soon call for new sanitary regulations.

#### CALCULOUS DISORDERS.

The extent to which urinary gravel occurs in domestic animals and the symptoms by which the trouble can be recognized, has not

received that attention in this country which the subject now demands. In a former paper I have alluded to the presence of urethral calculi in the ox,\* and the fatal consequences that are sure to follow if not attended to at once.

In the horse these concretions often become very large and thus cause great difficulty in urinating, as shown by frequent straining, and the passage of blood for weeks and months. The two successful operations of lithotomy, however, which I have recently performed, and the removal of a large stone from the bladder of both a horse and a mare, affords us hope that this serious difficulty, which no doubt is of more frequent occurrence than we have hitherto been aware, can be readily overcome and the patient cured.

#### CONCLUSION.

Thus I have glanced at some of the facts in comparative anatomy and pathology which every farmer should know in relation the diseases of animals. I have alluded to certain popular fallacies which, like "horn-ail" of old, will vanish from the mind as soon as the light of veterinary knowledge shall dawn upon the believer.

There are fallacies in therapeutics also which have long held sway, and one especially that deserves a passing notice. The favorite method among horsemen of treating pneumonia by the use of mustard pastes instead of hot applications to the chest, is fallacious in theory and unsuccessful in practice, as every physician and well-informed veterinarian knows. Hence, we are admonished on every hand to aid in the diffusion of practical scientific knowledge, that the diseases of live stock may be better understood, our health thus protected, and the afflicted animals more humanely treated.

The following resolutions were then read and unanimously adopted :

*Whereas, Pleuro-pneumonia, a very contagious and fatal disease among cattle, has a recognized existence in our country, threatening the most direful results on the prosperity of our farmers and dealers in and exporters of live stock, therefore be it resolved—*

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\* See Natural History of Bezoar stones, calculi, and other animal concretions, in Secretary's Report for 1878.

*First*, That the Connecticut Board of Agriculture, upon well considered action, do declare that the threatened evil, in their opinion, has become of national concern.

*Second*, That they recommend to their representatives in Congress to take into consideration the injuries which this disease, if unchecked or uncontrolled, is capable of, and to carefully devise immediate measures to regulate the movements of stock, and to take such other means as shall be necessary to eradicate the disease from the country.

*Third*, That, in the opinion of this convention, this emergency should be met with immediate action, and the measures to be devised should be thorough and radical.





